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Expert Declaration Submitted Under 37 CFR 1.132

Date Prepared: December 9, 2008
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Services Provided For: Mark Nowotarski as patent agent for patent applicant
Requested Service: Address the specific questions with respect to the U. S. patent application

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Qualifications

I am a vice president of Assessment Systems Corporation in St. Paul MN. My responsibilities include the design and development of computerized psychometric tests. In addition, I have a Ph.D. in Psychometrics from the University of Minnesota with a supporting area of industrial/organizational psychology. I am therefore qualified to render opinions on the subject matter of patent application "Risk Classification Methodology", US patent application serial number 10/601118 (Robertson et al.) and the cited prior art Lajunen et al.

I am an independent consultant. I have no conflict of interest with any of the parties otherwise related to any of the patents or patent applications referred to in this opinion.

Limitations and Reliances

This opinion is directed at responding to specific questions framed by Mark Nowotarski, the patent agent of record.

Mark Nowotarski provided information necessary for me to review and form an opinion in this matter. This information included a copy of the Robertson et al. patent application and a copy of an article by Lajunen and Summala (1995) (Lajunen et al.).

I have read and understood the Robertson et al. patent application and the article by Lajunen and Summala (1995) referenced in the questions, at least to the extent necessary to form an opinion on the specific subject matter of the questions I have been asked to consider.

Analysis and Opinion

The following text presents nine questions regarding the Robertson application and the Lajunen paper, and my responses.

1. *Does the disclosure by Robertson et al. provide enough information so that a person who is qualified in psychometric test design could develop a list of more than four target questions that increased the multiple correlation to the number of automobile insurance claims to at least the 5% level of confidence?*

   Answer: Yes. There is enough information in Robertson et al. for a person qualified in the field of computer implemented psychometric test design to develop a list of more than four target questions.
   Details: The statistical analysis process used by Robertson et al. produces the minimum number of target items (i.e. questions) from the candidate items that incrementally increase the multiple correlation with the dependent variable, automobile insurance claims. These items, however, are not the only items in the candidate questions that increase the multiple correlation. Many of the candidate items measure the same personality trait and hence their answers will be correlated with each other. This means that these redundant items can be added to the original four target items without compromising either the level of correlation or its statistical significance.

   For example, one of the original four target items that Robertson et al. identified was "I don't find it particularly difficult to get along with loud mouth obnoxious people". A person skilled in psychometric testing will recognize this item as being indicative of the personality trait "social desirability". "Social desirability" in turn is a component of the major personality trait "Agreeableness". Another one of the candidate items listed by Robertson et al. but not one of the four original four target items was "I can think of no good reason for hitting anyone". A person skilled in psychometric testing will recognize this item as also being indicative of the major personality trait "Agreeableness", hence the answers to both questions will be correlated to each other. Thus, one would expect that this item could be added to the set of target questions to bring the total number of target questions to five without compromising either the level correlation or its statistical significance.

2. *Does Lajunen et al. describe a process where they select four or more target questions from a set of candidate questions based on the results of a multiple correlation to insurance claims?*

   Answer: No. Lajunen selected the target questions for their survey from a set of candidate questions found in a number of known personality tests based on theoretical considerations, not empirical results.
   Details: Lajunen et al. specifically say on page 309, line 23, that they selected their target items from candidate items founds in different sets of known personality scales (e.g. Levenson, Zuckerman, etc.) based on theoretical aspects. It would have required a

pilot study to select items based on empirical aspects for inclusion in the final study. Selecting the best items in each of these scales, however, was not the goal of their research. There was no reason, therefore, to perform this kind of pilot study, especially given the time and expense involved.

3. *In your opinion, what are the most significant personality factors related to a person's tendency to report an accident to an insurance company? Did Lajunen measure any of these factors?*

   Answer: The most significant major personality factors related to a person's tendency to report an accident are Conscientiousness and Agreeableness. Lajunen et al. did not measure either of these traits. Their absence is noteworthy.
   Details: The goal of Lajunen's study was correlating personality factors with perceived driving skill and safety, not accident reporting. The variables utilized reflect this; traits found in the rows of Table 4 include sensation seeking, competitiveness, and other traits that might be linked to safety. Accident reporting is a different type of dependent variable.

   Theoretically, I think the most significant major personality factors in the reporting of (as opposed to involvement in) accidents are conscientiousness and agreeableness. Conscientiousness is relevant because it refers in part to the strength of a person's conscience in their behavior, as well as to being deliberate in behavior. Agreeableness is relevant, as aspects of it are concerned with being considerate and believing others are trustworthy. The lack of conscientiousness and agreeableness in Table 4 of Lajunen et al. is conspicuous, as they are two of five primary personality traits agreed upon by personality researchers. It is important to note that these two traits are represented by the first and third of the Robertson et al.'s four questions shown to be correlated to accident involvement and reporting (Robertson page 10 line 25 to page 11 1ine 5). They are also represented by the more particular personality traits listed on page 8 of Robertson et al. "Social desirability", for example, is a component of agreeableness.

4. *Does Lajunen et al. describe a process where 200 or more subjects are given a survey of 50 or more questions (i.e. items) that are indicative of personality traits that may affect accident involvement and reporting?*

   Answer: No. Lajunen et al. reported a study that only used 113 subjects.
   Details: Lajunen et al. reported a study that:
   a) Only used 113 subjects;
   b) The subjects were only given several existing personality-related scales rather than a survey specifically constructed for this purpose as Robertson et al. does; and
   c) Correlated the results of those scales against self-report measures of driving skill and safety-motive.

   The key difference is the dependent variable. Lajunen et al. utilized psychological rating scale type self-report measures as dependent variables, whereas Robertson et al. utilized actual accident involvement dependent variables. 113 subjects was a large enough

sample for Lajunen et al.'s purpose. Increasing the number to 200 or more would have significantly added to the cost without necessarily increasing the validity of the results.

Lajunen at al. were interested in correlating personality variables with psychological variables, and Robertson et al. correlated personality variables with actuarial variables. Specifically, the actuarial variable, "accident involvement and reporting" as described in Robertson et al. is not found in Table 1 of Lajunen et al. Lajunen's Table 1 presents the primary dependent variables of the study, which were underlying factors of self-reported driving characteristics, derived by a factor analysis. Factor analysis is a statistical methodology commonly used in psychological research to determine latent psychological factors and the strength of the correlation between individual items and those factors.

5. *Lajunen makes reference to a study by Spolander (1983) in the second paragraph of his introduction. Is there any indication from Lajunen's paper that the "driver self assessments" of Spolander comprised items that are "indicative of personality traits that may affect accident involvement and reporting" as we have used that term?*

Answer: No. Lajunen et al. does not give any indication that Spolander's study comprised items that are indicative of personality traits that may affect accident involvement and reporting.
Details: As Lajunen et al. discuss the driver self-assessments of Spolander, they only mention that the self-assessments are regarding "technical and defensive driving skills." These are compared to actual driving skills, not personality variables. Given Lajunen's description, it appears that the primary purpose of Spolander's research was to explore the gap between actual and perceived driving skill, with no mention of personality traits.

6. *Would it have been possible for Lajunen et al. to "control for age" as that phrase is used by Robertson et al.?*

Answer: No. Lajunen et al. sampled a population of university students that were all about the same age. It is not possible to meaningfully control for age if all of the sample population has about the same age.
Details: A sample is needed with a broad range of ages in order to statistically control for age. Lajunen only used a sample of university students that were all about the same age. They did not use a sample of a cross-section of the general population with ages in the range of 16 to 77 years, as Robertson et al. did (Robertson p. 10 lines 5 to 15). Thus it would not have been possible for Lajunen to "control for age" as Robertson did. This further speaks to the limited scope and purpose of the Lajunen study; they were primarily interested in the psychological factors that would be common across ages, rather than apply the results in combination with age and other conventional factors in the prediction of behavior.

7. *Does Lajunen et al. make any attempt to reduce their number of target questions to a critical few correlated with accident involvement on based on the results of their survey?*

Answer: No. Lajunen et al. made no attempt to reduce the number of items to a critical few correlated with accident involvement. Nor would it have been possible based on their method of data analysis.
Details: Lajunen et al. do not examine correlations between the personality scales and actual accident involvement and reporting. Nor do they examine individual items in an effort to pick the best-correlating ones to create a new scale. This is evident in Tables 1 and 4 of Lajunen. In Table 1, they examine each individual item with respect to its correlation on the latent factors, but have no intent of eliminating items and retaining only those with the strongest correlation. Table 4 examines correlations between personality scales and the self-report driver skill inventory factors. This table, however, did not provide any evidence that Lajunen et al.'s survey could be shortened and still obtain meaningful results. Moreover, Table 4 examines only full scales and subscales, not individual items, as Lajunen was interested in which psychological scales/subscales would correlate with the self-report factors.

8. *Robertson et al. selected 4 target items from their survey based on empirical evidence. In your opinion, was the number 4 an arbitrary choice for Robertson et al.?*

   Answer: No. The number of target items was determined by the actual results Robertson et al. got in their study. It was not a mere design choice.
   Details: The most important consideration with regards to how many items to select is, in my opinion, the actual empirical evidence that items correlate with the variable of interest. This is referred to as the validity correlation. A related aspect is *incremental validity*, which is the extent that items provide information on top of the conventional predictor variables. Both should be taken into account. Whether two items or ten turn out to be correlated, it is an empirical question that is determined by the results of the study and not the design choice of the researcher.

9. *Is there any known single personality trait that would be measured by the four questions that Robertson et al. found correlated with auto insurance claims?*

   Answer: No. The four questions identified by Robertson et al. do not cover any recognized single personality trait.
   Details: The reporting (and involvement, to a lesser extent) in accidents is likely related to the two personality traits of Conscientiousness and Agreeableness, as previously discussed. The first of the four questions, "I don't find it particularly difficult to get along with loud-mouthed, obnoxious people" is the type of item that is found on an Agreeableness scale. The third item, "I usually think carefully before doing anything" is the type of item that would be found on a Conscientiousness scale. The four questions of Robertson et al. therefore, do not cover a single recognized personality trait.

Declaration
I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these

statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Signature:  Date: Dec. 9, 2008